GROUNDWATER MANAGEMENT: LAW AND LOCAL RESPONSE†

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Since 1960 we have read about "Law and Politics of Groundwater in Arizona"[1] and about "The Politics of Water in Arizona"[2] by the same author. In these studies, the original materials for the studies, in decisions of the Arizona Supreme Court[3] and in the administrative functions of the State Land Commissioner,[4] we can read part of the record of community attitudes toward self-regulation, or self-restraint, as applied to groundwater withdrawals and uses. This record, including *State ex rel. Morrison v. Anway*,[5] may not make one sanguine about law or politics — or human nature. However, politics is in the realm of continuing community and individual choice; law is the *result* of the process of choice.

The political process assumes a broad spectrum of goals; and the final choice even of a groundwater statute may reflect little more than compromise, or apathy, greed and ignorance. In the decisional process of courts there also are choices within the limits of the positive law, and the doctrinal excursions and capacity of judges. And, as was made evident in *Bristor v. Cheatham* in 1953,[6] all judges are not driven inexorably toward the acceptance of one rule or another in the law of ground water.

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[1] Mann, *Law and Politics of Groundwater in Arizona*, 2 ARIZ. L. REV. 241 (1960).

[2] MANN, THE POLITICS OF WATER IN ARIZONA (1963). See Sax's review, 4 NAT. RES. J.——— (1964).

[3] See Note, 3 ARIZ. L. REV. 115 (1961). See also STRUCKMEYER & BUTLER, WATER: A REVIEW OF RIGHTS IN ARIZONA (1960).

[4] ARIZ. REV. STAT. ANN. §§ 45-301 to -324 (1956) (Supp. 1963); see also ARIZONA STATE LAND DEPARTMENT ANNUAL REPORT ON GROUND WATER IN ARIZONA, SPRING 1962 TO SPRING 1963, WATER RESOURCES REPORT No. 15 (Sept. 1963).

[5] 87 Ariz. 206, 349 P.2d 774 (1960), noted 3 ARIZ. L. REV. 115 (1961).

[6] 75 Ariz. 227, 255 P.2d 173 (1953); Note, *Ownership Rule Restored in Arizona*, 26 ROCKY MT. L. REV. 104, 107 (1954):

> By this decision the court overlooked its next best chance to halt the

I. Background, Doctrine and Legislation

The report of the Senate Select Committee in 1961,[7] the decision and decree in *Arizona v. California*[8] in 1963, the interest in the Central Arizona Project[9] before and since the Secretary of the Interior's

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depletion of Arizona's water. The correlative rights rule, allowing for the proportional division of water *actually available* each year, might conceivably have been enforced by a complex legislative code, but the court rejected it and chose the reasonable use rule instead. It is now doubtful whether the Arizona legislature can constitutionally define reasonable use strictly enough to stop the rapid drain of limited ground water supplies. Therefore, it is likely that only by state condemnation and the payment of just compensation can the virtual mining of the aquifers be controlled.

A similar comment is found in Million, Lesar, Kharas, Martz, *Real and Personal Property*, 29 N.Y.U.L. Rev. 775, 827 (1954):

Underground Waters. — Ground-water rights and regulations retained a prominent place in water-law discussions during the past year. A year ago by a three-to-two decision in *Bristor v. Cheatham* the Arizona court repudiated all common-law proprietary ground-water doctrines and declared that the rule of appropriation has always governed the acquisition of private rights in nontributary percolating water in that state. It stated that any other rule would shackle the Legislature from enacting an underground-water code to prevent the exhaustion of ground-water supplies. Upon rehearing this year, the court in another three-to-two decision shifted back to a reasonable-use doctrine. It was persuaded that such a rule had been adopted in earlier decisions, had been relied upon by water users, and should not be displaced at this late date. By its own statement in the earlier *Bristor* decision, it has accordingly barred effective conservation measures and has left the constitutionality of the present and contemplated Arizona ground-water codes in doubt.

The two decisions in *Bristor* and the agony of the judges in their choices brings to mind Cardozo's statement about prior appropriation doctrine:

> Sooner or later, if the demands of social utility are sufficiently urgent, if the operation of an existing rule is sufficiently productive of hardship or inconvenience, utility will tend to triumph. "The view of the legal system as a closed book was never anything but a purely theoretical dogma of the schools. Jurisprudence has never been able in the long run to resist successfully a social or economic need that was strong and just." We have a conspicuous illustration in the law of waters in our western states . . . . Here we have the conscious departure from a known rule, and the deliberate adoption of a new one, in obedience to the promptings of a social need so obvious and so insistent as to overrun the ancient channel and cut a new one for itself.

Selected Writings of Benjamin Nathan Cardozo, The Choice of Tycho Brahe 238-39 (Margaret Hall ed. 1947).

[7] S. Rep. No. 29, 87th Cong., 1st Sess. (1961).

[8] 373 U.S. 546 (1963), Decree, 376 U.S. 340 (1964); Wilmer, *Arizona v. California, A Statutory Construction Case*, 6 Ariz. L. Rev. 40 (1964). See also Haber, *Arizona v. California — A Brief Review*, 4 Nat. Res. J. 17 (1964); Trelease, *Arizona v. California*, The Supreme Court Review 158 (1963).

[9] See *Hearings on S. 1658 (Central Arizona Project) Before the Subcommittee on Irrigation and Reclamation of the Senate Committee on Interior and Insular Affairs*, 88th Cong., 1st Sess., pt. 1, at 3, 41, 45, 66-67, 93, 98-99, 117, 148, 155-156, 157, 170, 180, 191, 192, 193, 208, 216 (1963), where ground water matters are discussed. See also *Hearings on H.R. 1500 and H.R. 1501 Before the House Committee on Interior and Insular Affairs*, 82d Cong., 1st Sess. (1951); *Hearings on S. 75 Before the Senate Committee on Interior and Insular Affairs*, 81st Cong., 1st Sess. (1949); *Hearings on S. J. Res. 4 Before the Senate Committee on Interior and Insular Affairs*,

proposed Pacific Southwest Water Plan[10] and the proposals inspired by the Plan and now pending in Congress[11] encourage one to examine the range of choice in water resources development including law. However, this effort explores experiences in a few Western states where new or amended *ground* water legislation has been inspired by varying community attitudes and where these attitudes can be gauged by the legislation enacted, by administrative action, and by decisions of the courts.

Previous studies of groundwater legislation in the Western states through 1959[12] indicated a trend toward more public management of ground water withdrawals. The importance of administrative controls was shown in a study of Western *surface* water resources made a generation ago.[13] The public and legislative attitudes examined in these studies and the passage of subsequent legislation, particularly *ground* water statutes, reveal generally three types of effort or response:

1. In several states the need for better public management of all water resources, and specifically *ground* water, has been recognized largely within the framework of existing law and doctrine. In these states through statutory revision, amendment and judicial decision, older water law has been interpreted or expanded to cover

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81st Cong., 1st Sess. (1949), a joint resolution granting consent of Congress to joinder of the United States in a suit over Colorado River waters; *Hearings on H.R. 934 and H.R. 935 Before the Subcommittee on Irrigation and Reclamation of the House Committee on Public Lands,* 81st Cong., 1st Sess., pts. 1 and 2 (1949); H. R. Doc. No. 136, 81st Cong., 1st Sess. (1949).

[10] DEPARTMENT OF THE INTERIOR REPORTS ON PACIFIC SOUTHWEST WATER PLAN, August 1963 and Appendix; January 1964.

[11] See S. REP. No. 1330, 88th Cong., 2d Sess. (1964). This is the report of the Senate Committee on Interior and Insular Affairs, to which was referred S. 1658, recommending that the bill, as amended, do pass. This second S. 1658 is a substitute bill for the original S. 1658 which was introduced by Senators Hayden and Goldwater on June 4, 1963, the day after the decision in Arizona v. California, for the construction of the Central Arizona Project. See also the statements of Senator Kuchel, 110 CONG. REC. 8830, 16091, 16099 (1964). S. 2760, 88th Cong., 2d Sess. (1964), introduced by Senator Kuchel, would authorize a Pacific Southwest Project. H.R. 11352 and H.R. 11480, 88th Cong., 2d Sess. (1964), were for the same purpose. Legislation relating to the Lower Colorado River Basin has been introduced by the Senators from Arizona and California in the present session of the 89th Congress, January 7, 1965. See 111 CONG. REC. 324, 384 (1965).

[12] Clark, *Ground Water Legislation in the Light of Experience in the Western States,* 22 MONT. L. REV. 42 (1960); Hutchins, *Ground Water Legislation,* 30 ROCKY MT. L. REV. 416 (1958); Hutchins, *Trends in the Statutory Law of Ground Water in the Western States,* 34 TEX. L. REV. 157 (1955); McHendrie, *Underground Water Legislation,* 23 ROCKY MT. L. REV. 439 (1950); McHendrie, *The Law of Underground Water,* 13 ROCKY MT. L. REV. 1 (1940). For a recent study of one state see Harnsberger, *Nebraska Ground Water Problems,* 42 NEB. L. REV. 721 (1963).

[13] Lasky, *From Prior Appropriation to Economic Distribution of Water by the State — Via Irrigation Administration,* 1 ROCKY MT. L. REV. 161, 248 (1929); 2 ROCKY MT. L. REV. 35 (1929).

ground water. In these states the trend away from the English landowner's rule of unlimited withdrawals[14] and toward the acceptance of prior appropriation doctrine and public regulation requirements is clearly seen. Oregon[15] and New Mexico[16] are early examples. Utah,[17] Nevada,[18] Kansas,[19] Idaho,[20] North Dakota,[21] South Dakota[22] and Wyoming[23] are later examples. The form of enactment of this legislation is less important than the objectives specified in the statute or by the courts, and these objectives vary greatly in comprehensiveness, the Washington statute of 1945[24] perhaps having the broadest surface-ground water coverage.

2. Another group of states has expressed concern by enacting legislation in somewhat different form. Examples are the separate ground water "codes" of Arizona, Colorado and Montana.[25] Nebraska[26] enacted well registration legislation in 1957 and a conservation district statute in 1959. All of this legislation is of comparatively recent date and seems to represent the best-that-can-be-had type of choice.

The statutes in both of the above categories range in coverage from those with minimal well registration and licensing provisions to procedures for acquiring rights and for preventing overdrafts in desig-

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[14] This is usually called the common law rule or the absolute ownership rule and is repeatedly said to derive from Acton v. Blundell, 12 M. & W. 324, 152 Eng. Rep. 1223 (1843), and Chasemore v. Richards, 7 H.L. Cas. 349, 11 Eng. Rep. 140 (1859). However, Greenleaf v. Francis, 18 Mass. (34-35 Pick.) 117 (1836) preceded both English cases.

[15] Ore. Laws ch. 410 (1927), repealed by ORE. REV. STAT. §§ 537.505-.795 (1963), in effect east of the summit of the Cascades. The present law applies to the entire state.

[16] N.M. STAT. ANN. §§ 75-11-1 to -36 (1953) (Supp. 1959).

[17] UTAH CODE ANN. §§ 73-3-1 to -6 (1953).

[18] NEV. REV. STAT. §§ 534.010 - .190 (1957).

[19] KAN. GEN. STAT. ANN. § 82a-702 (1949).

[20] IDAHO CODE ANN. §§ 42-226 to -239 (Supp. 1963).

[21] N.D. CENT. CODE §§ 61-01-01.1 to -04-21 (Supp. 1963); *cf.* § 47-01-13 (1960). See Volkmann v. City of Crosby, 120 N.W.2d 18 (N.D. 1963); 38 N.D.L. REV. 243 (1962); 37 N.D.L. REV. 260 (1961).

[22] S.D. CODE §§ 61.0401 - .0415 (Supp. 1963). See Knight v. Grimes, 127 N.W.2d 708 (S.D. 1964).

[23] WYO. CODE ANN. §§ 41-121 to -129 (1957).

[24] WASH. REV. CODE § 90.44.010 (1962).

[25] ARIZ. REV. STAT. ANN. §§ 45-301 to -324 (1956) (Supp. 1963); COLO. REV. STAT. ANN. §§ 148-18-1 to -15 (Supp. 1960); MONT. REV. CODES ANN. §§ 89-2911 to -2936 (1961).

[26] NEB. REV. STAT. §§ 46-601 to -613, -614 to -634 (1943) (Supp. 1963). Nebraska water law problems are thoroughly discussed in Harnsberger, *supra* note 12. The author uses a different method to categorize the states with ground water "codes."

nated areas and other forms of public control. In Arizona, Colorado, Montana and Nebraska special peculiarities in *ground* water law must be noticed. Three are simon-pure appropriation states as applied to *surface* waters. In Arizona "subterranean streams" are also subject to appropriation.[27] But percolating waters fall within the "reasonable use" doctrine.[28] Colorado's non-tributary ground water basins are subject to the landowner's rule on withdrawal.[29] In Montana the senescent common law rule has recently been revitalized.[30] Nebraska, which adopted prior appropriation doctrine as to *surface* waters in 1889, follows a rule of "reasonable use" modified by "correlative rights" notions as to *ground* waters.[31]

3. In California and Texas, the two heaviest users of ground water in the country,[32] the *status quo ante* has largely been pre-

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He includes Idaho, Nevada, New Mexico, Oklahoma, Oregon, Washington and Wyoming with Arizona, Colorado and Montana in the group having "Separate Underground Water Codes." See Harnsberger, *supra* note 12 at 746. His method may be better than the one I have chosen. However, the word "code" is ambiguous and the later or separate legislation in these states is often tied closely to the general water statutes, as, for example, in New Mexico, State *ex rel.* Reynolds v. Sharp, 66 N.M. 192, 344 P.2d 943(1959), and, as Harnsberger recognizes, in Kansas, North Dakota, South Dakota and Utah, *supra* note 12 at 747.

[27] Maricopa County Municipal Water Conservation District v. Southwest Cotton Co., 39 Ariz. 65, 4 P.2d 369 (1931) and cases cited therein.

[28] Bristor v. Cheatham, 75 Ariz. 227, 255 P.2d 173 (1953).

[29] Whitten v. Coit, 385 P.2d 131 (Colo. 1963), held that a judicial decree rendered in 1948 in adjudication proceedings prior to enactment of Ground Water Law of 1957 which purported to fix priorities from underground sources not tributary to any natural stream was void for want of jurisdiction over subject matter and such waters not subject to prior appropriation. See Note, 16 STAN. L. REV. 721 (1964). See also Kelly, *Colorado Ground Water Act of 1957 — Is Ground Water Property of the Public?*, 31 ROCKY MT. L. REV. 165 (1959). *Cf.* Martz, *Who Has the Better Right to Non Tributary Ground Waters in Colorado — Landowner or Appropriator?*, 31 DICTA 20 (1954).

[30] McGowan v. U.S., 206 F. Supp. 439 (D. Mont. 1962), relying on a dictum in Ryan v. Quinlan, 45 Mont. 521, 124 Pac. 512 (1912). *McGowan* was a Tucker Act case in which plaintiff alleged injury as a result of a government drainage and irrigation project which dried up plaintiff's springs which arose from percolating waters. The court held the injury was *damnum absque injuria.* Criticized in Note, 24 MONT. L. REV. 169 (1963). See also U.S. v. 31.07 Acres of Land, 189 F. Supp. 845 (D. Mont. 1960).

[31] Harnsberger, *supra* note 12, at 730, citing all Nebraska cases in notes 26 through 29.

[32] Data for 1955 show the following:

California	11,200,000 acre feet withdrawn for irrigation
Texas	7,300,000 acre feet withdrawn for irrigation
Arizona	5,280,000 acre feet withdrawn for irrigation
New Mexico	1,500,000 acre feet withdrawn for irrigation

MACKICHAN, ESTIMATED USE OF WATER IN THE U.S., CIRCULAR 398, U.S.G.S. (1957). Data for 1959 submitted to a Senate Select Committee indicates the trend toward still heavier uses; see, *e.g.*, SENATE SELECT COMMITTEE ON NATIONAL WATER RESOURCES, 86th Cong., 2d Sess., WATER RESOURCES ACTIVITIES IN THE UNITED STATES, VIEWS AND COMMENTS OF THE STATES (Comm. Print No. 6, 1960) [hereinafter cited as Comm. Print No. 6], p. 6 (Arizona), p. 14 (California), pp.

served with little legislative change: "In California today anybody is permitted to sink a well and pump water. No license or permit is required. A man can drill a well and pump the water for use on his overlying land. . . . The present law contains no protection against overpumping and abuse of a ground water basin. . . ."[33]

The Texas statute of 1949[34] confirms the common law rule: "The ownership and rights of the owner of the land, his lessees and assigns, in underground water are hereby recognized, and nothing in this Section 3c shall be construed as depriving or divesting such owner . . . subject, however, to rules and regulations promulgated pursuant to this Section 3c. . . .," which provides for the voluntary formation of Underground Water Conservation Districts.

These gross distinctions can be applied to statutory and judicial developments in the other 33 states of the humid regions, although it will be found at once that there is little *ground* water legislation and that the landowner's right to unlimited withdrawals is the general rule[35] in these states with concessions in some to "reasonable use"

233-244 (New Mexico), pp. 338-342 (Texas). See also FIFTY YEARS OF WATER DEVELOPMENT IN TEXAS, TEXAS WATER COMMISSION BULLETIN #6403, p. 16 (April 1964).

[33] Krieger, *The Law of the Underground*, 34 CIVIL ENGINEERING 52 (March 1964). The California Water Code added a ground water protection law in 1961, CAL. WATER CODE §§ 12920 - 12925 (Supp. 1964). Earlier legislation provides for ground water credits for cessation in use or in extraction and replenishment from alternate sources, and applies in eight counties, CAL. WATER CODE §§ 4999, 5000 - 5007 (Supp. 1964). But none of this legislation establishes administrative controls over withdrawals. See also CAL. WATER CODE §§ 6000 - 60449 (1956) (Supp. 1964).

[34] TEX. REV. CIV. STAT. art. 7880-3c (Supp. 1964); HUTCHINS, THE TEXAS LAW OF WATER RIGHTS 588 (1961); Greenhill and Gee, *Ownership of Groundwater in Texas; The East Case Reconsidered*, 33 TEX. L. REV. 620, 628 (1955). Public regulation of artesian waters is recognized, but only to prevent waste and not to control uses. See TEX. REV. CIV. STAT. arts. 7600 - 7617 (1954) (Supp. 1964).

[35] VIA AMERICAN LAW OF PROPERTY § 28.66 (Casner ed. 1954); 1 THOMPSON, REAL PROPERTY § 75 (perm. ed. rev. 1939); 3 TIFFANY, REAL PROPERTY §§ 746, 747 (3d ed. 1939). It is recognized that this rule does not generally apply where there is malicious interference with another's water supply. See Murphy, *A Short Course on Water Law for the Eastern United States*, 1961 WASH. U.L.Q. 93, 120-123 (1961), for criticism of the common law rule; Harnsberger, *supra* note 12 at 727 and references cited therein. See also Adams v. Grigsby, 152 So. 2d 619, 624 (La. 1963), *writ denied*, 153 So. 2d 880 (La. 1963), where in holding for the defendant oil operator using secondary recovery methods as against claims of plaintiffs and domestic users the court said:

> Quite obviously, as between the parties, the amount of water withdrawn, and therefore owned, may be more or less dependent upon the need and use thereof. In the absence of statutory regulation, apportionment or allocation of the amount of water which may be withdrawn from a common reservoir, we conclude that courts are without authority to establish such nature of regulation by judicial pronouncement. It follows that the coincidental damages suffered by plaintiffs must be regarded as damnum absque injuria.

doctrine.[36] Recent statutes in Iowa, Indiana, New Jersey, New York, Florida, Maryland, Minnesota and Wisconsin undertake some form of

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This case is criticized in Note, 24 LA. L. REV. 428 (1964) and Note, 38 TUL. L. REV. 583 (1964).

The consequences of the common law rule in another state are carefully examined in Comment, *The Law of Underground Water; A Half Century of Huber v. Merkel,* 1953 WIS. L. REV. 491 (1953); Comment, *Wisconsin Ground Water Law—A New Era,* 1957 WIS. L. REV. 309 (1957). The common law rule in a number of states rests on dicta. See, *e.g.,* CRIBBET, ILLINOIS WATER RIGHTS LAW 6 (1958):

> The Illinois law of groundwater rests on a single case decided in 1899. Edwards v. Haeger [180 Ill. 99, 54 N.E. 176 (1899)] is generally considered to place Illinois in the list of states following the English common law rule laid down in [Acton v. Blundell, 152 Eng. Rep. 1223 (1843)]. This conclusion, however, is based more on what the court said than on what they actually held . . . .

See Annot., 29 A.L.R.2d 1354, 1357 (1953), which lists the states, through 1950, that follow the English rule and includes California, Nevada and Utah in the group of nineteen. Several of the same states are also listed as following the "reasonable use" rule. This observation is not a reflection on the researcher but on the state of ground water law preceding World War II.

[36] Reasonable use of ground waters does not require the overlying owners to share the supply in place. The requirement is simply that the supply be put to a reasonable use or a beneficial purpose *in relation to the land.* The West Virginia court said, in Pence v. Carney, 58 W. Va. 296, 305, 52 S.E. 702, 706 (1905), that "such reasonable or beneficial use has often been understood and held to mean, use for any purpose for which the owner of the land upon which underground, percolating waters are found might legitimately use and enjoy his land." The later case of Drummond v. White Oak Fuel Co., 104 W. Va. 368, 375, 140 S.E. 57, 60 (1927) reaffirmed application of the rule "to any purpose for which a landowner 'might legitimately use and enjoy his land.' "

The "reasonable use" rule as developed in the law of *ground* waters must be distinguished from the "correlative rights" rule. Although both are modifications of the common law rule, the "correlative rights" rule follows more closely an analogy to the *surface* water doctrine of riparian rights. The "reasonable use" limitations on "natural flow" or "natural uses" theories found in *surface* water law are analogous to "correlative rights" notions, *i.e.,* proportionate sharing of the supply rather than the reasonableness of the use *on the land from which the water is withdrawn.* The development of these rules has not at all times been consistent or clear, but the distinctions have been pointed out, Lugar, *Water Law in West Virginia,* 66 W. VA. L. REV. 191, 213-216 (1964); Harnsberger, *supra* note 12 at 728:

> The main practical difference between the American rule of reasonable use and the English common law doctrine appears to be the possibility of a local user restricting the taking and transporting of underground water for use on land which does not overlay the aquifer. Stated affirmatively, the right of an overlying owner to take and use ground water seems to be almost as absolute under one doctrine as under the other.

Note the following statement from MCDOUGAL AND HABER, PROPERTY, WEALTH, LAND (1948):

> Under the so-called English or Common Law rule of "percolating waters," as announced in Acton v. Blundell, individualism is permitted to reign rampant so long as no "malice," negligence or useless "waste" is shown. While some American jurisdictions still purport to follow this doctrine, the obvious impossibility of its unflinching application to a society that has more and more come to use groundwater supplies for industry, agriculture and large scale domestic needs has led to its modification in many localities. The resulting so-called American rule permits each landowner the "reasonable use" of water in such manner as not to harm the claims

administrative control over ground waters or of both surface and

of neighboring owners to the common groundwater supply. As applied, this rule generally requires that water can not be transported away from the land owned by the tapper of the supply to the injury of other overlying landowners, even though use away from the overlying land may be more beneficial to the community. Aside from this undesirable consequence, the "reasonable use" concept is totally ambiguous and unpredictable and provides no guide to prospective water users. To overcome this difficulty equalitarian rigidity has been introduced in the name of the "correlative rights" doctrine under which in a time of water shortage each landowner is said to have a share of the underlying water in proportion to the amount of land he owns as compared with the total area supplied by the common water source. This again provides little assurance to developers unfamiliar with the hydrologic data necessary to estimate long range water supply and takes no account of the relative values of different uses in the community. Moreover neither "reasonable use" nor "correlative rights" theories succeed in removing the basic drawbacks of judicial administration of groundwater distribution. The hydrologic data required for adequate information about supply, evaporation and movement of groundwater are difficult to obtain and the courts do not have adequate staffs to do the necessary fact gathering job. Consequently the parties must supply the experts at great expense. These too frequently can do no better than guess, for adequate information usually requires long term collection of data on the interdependences of water, weather and land-use in a particular locality. Moreover, the courts which have a long record of ignoring scientific development in this field and are certainly not expert agencies from an engineering perspective, gain little from listening to the opposing views of scientists hired by the parties. This is especially shown by cases where parties seek injunctions to prevent harms that have not yet occurred. The courts require the clearest kind of proof, which is frequently not forthcoming, and parties must wait for the dubious remedies available after the harm has occurred. This judicial failure to achieve rational distribution of groundwater supply is of course not only harmful to the litigants but also to the community.

In some of the Western states, percolating water is subject to prior appropriation, a doctrine which does not by itself solve the basic difficulties. But to the extent that some of these states by statute empower a state engineer to supervise the obtaining of appropriation rights and their use from day to day in the light of the availability of water and a priority schedule of uses required by the community, a step in the right direction has been taken. The Committee on State Water Law of the National Resources Planning Board has recommended the general adoption of such statutes with respect to groundwater as a solution for the Western states. With respect to large users of water such as cities and water supply companies similar state supervision of the tapping of new supplies has been provided in some of the Eastern states.

Though in Bristor v. Cheatham, 75 Ariz. 227, 235, 255 P.2d 173, 178 (1953), the Arizona court clarified the distinction between the reasonable use and correlative rights rules and followed an Oklahoma case which applied the reasonable use rule, the court in State *ex rel.* Morrison v. Anway, 87 Ariz. 206, 349 P.2d 774 (1960) appears to have blurred the distinction. Indeed the case makes the difference between the English rule and the two variations of it seem less significant.

The reasonable use rule has been examined in other jurisdictions in recent years with contrasting results. See Jones v. Oz-Ark-Val Poultry Co., 228 Ark. 76, 306 S.W.2d 111 (1957), applying the reasonable use rule, noted in 11 VAND. L. REV. 945 (1958); *cf.* Adams v. Grigsby, *supra* note 35, noted in 24 LA. L. REV. 428, 432-33 (1964):

At least twenty-three states have already recognized the growing importance of their underground fresh water resources and have enacted statutes governing their distribution and protection. While it is true that Louisiana is unusually blessed with bounteous water supplies, it is sub-

ground water.[37]

There is growing demand for better management of ground water resources in the West and in the East. The Senate Committee Final Report[38] contains this observation:

> A great many of the States have indicated the need for revision of their laws controlling ground water use, to deal with the growing problems. It is possible that where underground aquifers cross State boundaries consideration will have to be given to interstate compacts to control ground water withdrawals, to prevent one State from exhausting water supplies used by another State.

In the four states, California, Texas, Arizona and New Mexico, where ground water withdrawals are the largest[39] we find the greatest contrast in the West in the community approach to public management of this form of supply.

Pending litigation in the United States Supreme Court[40] emphasizes the ground water problems of municipalities in the humid Great Lakes region and reveals the lack of public control over groundwaters and the absence of coordination between *surface* and *ground* water management. Counsel for the Commonwealth of Pennsylvania outlined the problems:

> Consider, for example, the plight of three small Illinois communities located twenty-five miles from Lake Michigan. They are not riparian communities and they are outside the legal and geological basin of the Great Lakes. Until the post-

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mitted that cases do arise, and with increasing industrialization will arise more often in the future, when large consumers in one area provoke shortages. The possibility that industrial installations will be pitted against each other, or against farming or the domestic consumer, is not remote. Relief should be available to the landowner who is deprived of receiving a fair share of the waters beneath his land. To this end it is submitted that some sort of legislative scheme should be enacted which would specifically empower the commissioner of conservation to make the requisite findings, orders, and regulations necessary for equitable solution of water shortage problems whenever they arise and — what is more important — for the administration of these resources in such a manner as to eliminate the possibility of their occurrence.

The latter case is also noted in 38 TUL. L. REV. 583 (1964).

[37] See Harnsberger, *supra* note 12, at 748 where statutes are discussed. See also Ellis, *Some Current and Proposed Water-Rights Legislation in the Eastern States*, 41 IOWA L. REV. 237 (1956); Maloney, *Florida's New Water Resources Law*, 10 U. FLA. L. REV. 119 (1957); O'Connell, *Iowa's New Water Statute — The Constitutionality of Regulating Existing Uses of Water*, 47 IOWA L. REV. 549 (1962).

[38] S. REP. No. 29, 87th Cong., 1st Sess. 8 (1961).

[39] See *supra* note 32.

[40] Illinois v. Michigan, 360 U.S. 712 (1959) (motion granted for leave to file complaint); 361 U.S. 956 (1960) (motion for U.S. to intervene); 362 U.S. 958 (1960) (petition on intervention referred to Special Master).

war period, ground water supplies were adequate and provided very cheap water of high quality. When the population of these communities rose to 90,000 it was apparent that a new source of water supply would have to be utilized. Pursuant to state law the local governments formed a joint water supply authority, the Elmhurst-Villa Park-Lombard Water Commission. Engineering studies indicated that the cheapest source of supply was Lake Michigan. The authorities purchased a small plot of land on the shores of Lake Michigan intending to build a pumping station and withdraw and divert out of the basin as much water as was desired for local domestic and industrial purposes. It was proposed also to sell water to neighboring communities and other industries which this group hoped to attract to the area. The other Great Lakes States, foreseeing a dangerous precedent and an unlimited depletion of the Great Lakes by similarly situated communities, filed letters of protest, whereupon the underwriters refused to proceed with the financing of the project until its legal status was clarified. The state of Illinois on behalf of these communities filed an original action for declaratory judgment against the other Great Lakes States in the United States Supreme Court. The Court referred the matter to a special master . . . .[41]

Groundwater problems are not confined to one country or one area of the Earth as a recent technical publication of the United Nations reveals:

[T]he various countries of the European region have been paying increased attention to groundwater legislation and to the administrative structures necessary for satisfactory implementation of legislation and regulations. In some countries, groundwater legislation has been found to be practically nonexistent or inadequate, while elsewhere the application of existing legislation and regulations has proved insufficient because of inade-

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[41] Forer, *Water Supply: Suggested Federal Regulation*, 75 HARV. L. REV. 332 (1961). See also PROGRESS REPORT OF THE TEMPORARY COMMISSION ON WATER RESOURCES PLANNING OF THE STATE OF NEW YORK (1963), containing the following:

> There may have been a time when laws were conceived, drafted and enacted in what might be termed a 'solonistic vacuum.' There may have been a time when statutes were placed in the body of law and left by mere chance to make their way into public consciousness and public usage and compliance. That time is not today.
>
> Since laws are merely the reflection of the public's desires and the verbalization of principles of good citizenship, it follows that the public must play an active role in the creation of proposed laws, in their enactment into statutes, and in their application to public needs. . . . (at p. 154) As the State's program of water resources planning enters the action stage, as it now has with the initiation of the first multi-county regional planning program with the approval of the Water Resources Commission, it becomes more and more necessary to explore today's water allocation principles. It is essential to ascertain whether the full fruition of multiple water use can be achieved under the present water rights doctrine. (at p. 168)

See also NEW YORK CONSERVATION LAW §§ 401 - 641 (1964).

> quate administrative structures, and especially for want of coordination between the various governmental services responsible for the application of provisions relating to the different uses of groundwaters.[42]

We have been cautioned about the traditional non-scientific classification of water found in the law books.[43] Scientists have criticized themselves and the law on this subject:

> Man has coped with the complexity of water by trying to compartmentalize it. The partition committed by hydrologists — into ground water, soil water, surface water, for instance — is as nothing compared with that which has been promulgated by the legal profession, which has on occasion borrowed from the criminal code to term some waters "fugitive" and others, a "common enemy." The legal classification of water includes "percolating waters," "defined underground streams," "underflow of surface streams," "water-courses," and "diffuse surface waters;" all these waters are actually interrelated and interdependent, yet in many jurisdictions unrelated water rights rest upon this classification.[44]

The law of ground water cannot continue to slight the findings and knowledge of science and technology. The old, empirical, com-

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[42] See GROUNDWATER LEGISLATION IN EUROPE, F.A.O., Legislative Series No. 5 (United Nations 1964). See also LARGE SCALE GROUND WATER DEVELOPMENT (U.N. Pub. Catalog No. 60, II B. 3), ch. 5, Ground Water Legislation, where the following observations are found:

> 173. The primary object of ground water legislation is to ensure that a country's water resources are in all respects properly developed and conserved and that they are allocated fairly to the various principal uses. . . .
>
> 174. In countries with no previous experience in ground water development and where no ground water legislation exists, it should be possible to make any new law, decree, or administrative ordinance concise, flexible and enforceable.
>
> 175. Obscurity, vagueness, ambiguity and excessive qualification should be avoided in drafting. Failure to define the technical terms used may lead to trouble by obscuring the proper interpretation and intention of the law, particularly when court action has to be taken. For this reason, technical authorities, such as engineers and economists, should be fully consulted on all relevant points in the drafting of a new water law; this will avoid difficulties in applying legislation which have at times been traceable to neglect of this precaution.
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> 176. Every section of the law should be considered from the long-term viewpoint so that it will meet circumstances brought about by constantly changing conditions . . . .

[43] PIPER & THOMAS, *Hydrology and Water Law: What Is Their Future Common Ground?*, in WATER RESOURCES AND THE LAW 10-11 (1958); THOMAS, CONSERVATION OF GROUND WATER 248 (1951); Clark, *New Water Law Problems and Old Public Law Principles*, 32 ROCKY MT. L. REV. 437 (1960); Foley, *Water and the Laws of Nature*, 5 KAN. L. REV. 492 (1957); Kirkwood, *Appropriation of Percolating Waters*, 1 STAN. L. REV. 1 (1948); Wiel, *Need of Unified Law for Surface and Underground Water*, 2 SO. CAL. L. REV. 358 (1929).

[44] Thomas and Luna, *Ground Water in North America*, 143 SCIENCE 1001, 1003 (March 6, 1964).

mon sense categories devised in a period of less technical knowledge must be made to conform more closely to scientific principles if large projects involving ground water storage, recharge and pollution reduction, as well as traditional uses, are to be managed properly and if an undertaking like the Central Arizona Project[45] is to provide maximum service to a majority of the inhabitants of Arizona. The "realities of the hydrologic cycle," the Delaware River Compact[46] and Colorado River basin development all urge the recognition of the interrelationship between surface and ground water supplies. Emphasis on the connection between surface and ground water is found in this statement of two scientists:

> We have been discussing ground water more or less as if it were separate and distinct from the rest of the hydrologic cycle. Such segregation has been common among hydrologists as well as the general public, and is reflected in legislation, in the division of responsibility among government agencies, in development and regulation. Yet it is clear that this isolation can be maintained only when and where water is being mined from underground storage. Any water pumped from wells under equilibrium conditions is necessarily diverted into the aquifer from somewhere else, perhaps from other aquifers, perhaps from streams or lakes, perhaps from wetlands — ideally, but not necessarily, from places where it was of no use to anyone. There are enough examples of streamflow depletion by ground-water development, and of ground-water pollution from wastes released into surface waters, to attest to the close though variable relation between surface water and ground water.[47]

All water being pumped from below the earth's surface is either being replaced at measurable, or discernible, rates, or it is not. Where the replenishment rate is negligible the supply is being "mined."[48] The expression "overdraft" means an excess of withdrawal over recharge and in that context supply can also be said to be "mined" during the period this condition exists. Thus all ground water pumped is either "mined," *i.e.*, extracted for certain purposes over a relatively

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[45] See *supra* notes 9, 11.

[46] The Delaware Compact expressly recognized ground water problems, DEL. CODE ANN. Tit. 23, §§ 1001, 1011-1013 (Supp. 1962). The signatory parties are Delaware, New Jersey, New York, Pennsylvania and the United States.

[47] See Thomas and Luna, *supra* note 44.

[48] Continual overdraft is usually called "mining," see Thomas, *Water Rights in Areas of Ground-Water Mining*, 347 U.S.G.S. 9 (1955). See also MCGUINNESS, THE ROLE OF GROUND WATER IN THE NATIONAL WATER SITUATION, U.S.G.S. WATER SUPPLY PAPER No. 1800, p. 42 (1963):

> From the disparity between withdrawal and recharge and from the fact that the natural discharge continues unabated, it is apparent that virtually all the withdrawal in heavily pumped areas comes from storage — the water is being "mined." And this is in spite of the recovery, or slow-

short period of time, or it is being withdrawn or "milked" from nature's aquifers with some view to continued use for a long or indefinite period, or for a period of time that society, with technical assistance,[49] may choose. Over 65% of Arizona's total water supply is pumped

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ing of the decline, of water levels in wet years such as 1941, for the relatively abundant recharge in such years simply balances the small — or nonexistent — recharge in dry years to add up to the long-term average.

See also Garner, *Controls Over the Use and Discharge of Water,* 27 THE CONVEYANCER 489 (1964). See also Comm. Print. No. 6 at 234:

> It is desirable, of course, that the ground-water resources be available to future generations in perpetuity; however, the mining of water can be justified as readily as the mining of any of our other mineral resources such as uranium, oil, or coal. It is not practical to operate a ground water basin on a continuous-yield basis when the amount of water in storage is very large compared with the average annual recharge. An example is the Lea County Basin in southeastern New Mexico where the average annual recharge is 29,000 acre-feet per year and the permitted withdrawals will average about 440,000 acre-feet per year. The great value of the approximately 27 million acre-feet in storage in the basin when pumping began can be realized only by mining. Furthermore, to justify the marketing, storage, and transportation facilities essential to a competent agricultural economy in the area it is necessary for the withdrawals to exceed the recharge.
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> While it is possible to justify the mining of ground-water resources, the practice will make it necessary to face serious water supply problems in the future. In some instances it will be possible to meet these problems only by complete readjustment of the economy of the area. While long-range predictions of the value of water in various uses are dangerous, it appears likely that it will not be, in general, economically feasible to import water over appreciable distances for agricultural purposes when the local ground-water resources have been mined out. However, when reduced well yields or excessive lifts make pumping for agricultural purposes uneconomic, the residual water may well supply the municipal and industrial needs of a vigorous non-agricultural economy for many years.
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> In Lea County pumping for irrigation will probably be uneconomic when about two-thirds of the aquifer is dewatered. At that time there will probably remain substantial valuable reserves of oil and gas in the area. To produce and process those reserves it will be necessary to use numerous low-production wells to pump the residual fresh water, and it may also be necessary to desalinize the abundant brackish waters and brines that occur in the area.
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> Statement of S. E. Reynolds, State Engineer
> Santa Fe, September 30, 1959

[49] PROCEEDINGS, 32 ANNUAL CONVENTION OF NATIONAL RECLAMATION ASSOCIATION pp. 29-39 (October 1963), containing Maddock, *The Hydrologic Aspects of Ground-Water Management;* Banks, *Ground Water Management — Some Economic Aspects;* Broadhurst, *Ground Water Management at the Local Level;* Domenico, *Ground-Water Management.* In Krieger & Banks, *Ground Water Basin Management,* 50 CALIF. L. REV. 56, 77 (1962), after discussion of the essentials of basin management, the authors say:

> Ground water basin management in the urbanized and water-short areas of California demands the immediate attention of our courts, lawmakers, local governing bodies, and water distributing entities. The skill and resources of lawyers, engineers, geologists, economists, financiers, and political scientists must be brought to bear on the multitude of complex prob-

from underground.[50] There is an estimated annual overdraft on all underground sources of over 2 million acre feet of which 300,000 acre feet go to municipal and industrial uses. The Governor of Arizona in 1959 reported to the Senate Committee[51] that "no underground lakes or subsurface free flowing rivers are known to exist in Arizona. Apparently water moves slowly through gravel, sand and clay strata to alluvial fill valleys, where it has remained stored, except for natural outflow, for centuries untapped by wells." This is the multi-millenial supply Arizona is now taking from storage and the supply over which decisions must be made as to use and replenishment in the immediate future. Hopefully, in Arizona and elsewhere there may be established a plan of management for the short-term exhaustion of some areas of supply[52] and for the long-term continued

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lems created by the shortage. All water rights in critical ground water basins should be brought under the immediate and continuing jurisdiction of the courts. Water imported from outside the watershed must be stored underground with local waters, and the commingled supply maintained at levels commensurate with the maximum utilization of the basins for all purposes. To achieve this, existing agencies must exercise their joint powers liberally and constructively with a view to streamwide conservation. Where a new authority is required to achieve interbasin management, the Water Replenishment District Act is the most promising vehicle available. Resourceful and farsighted amendments are needed to clarify areas in which the law is uncertain and to equip governing bodies with the necessary powers to effectuate overall ground water basin management.

See also Piper, *Requirements of a Model Water Law*, 51 AM. WATER WORKS ASS'N. J. 1211 (1959); SMITH & BITTINGER, MANAGING ARTIFICIAL RECHARGE THROUGH PUBLIC DISTRICTS, PAPER No. 62-709, AM. SOC. OF AGRIC. ENGINEERS (1962).

[50] See Comm. Print. No. 6 at 6. See also ARIZONA'S WATER SUPPLY (Arizona Academy, Town Hall April 6-8, 1964) for detailed figures on Arizona's supply and demand. The report contains this admonition which is appropriate here: "This is perhaps the place to point out that readers may be disturbed to find that no two analyses of the water problem will *numerically* agree. . . . Even allowing for considerable error, there can be no escape from the fact that approximately half of our present use of water represents "deficit spending." (Emphasis added.) The Arizona report relies on U.S.G.S. GEOLOGICAL SURVEY WATER SUPPLY PAPER No. 1800, *supra* note 48.

S. REP. No. 1330, *supra* note 11 at 12, contains the following statements:

The immediate occasion for this bill [S. 1658] is the need for supplemental water in central Arizona. This area is, and for many years has been, one of the most rapidly growing in the Nation. This growth has been based on the mining of local ground waters; that is, their extraction without replenishment. The overdraft on the ground water now exceeds 2.2 million acre feet per year.

[51] *Ibid.*

[52] See, *e.g.*, Comm. Print No. 6 at 233-34, New Mexico's plan for certain areas:

The use of ground water for irrigation in the State of New Mexico has developed rapidly in the past 20 years. . . .

use and recharge of other sources of ground water or until cheaply converted sea water is available. Where physical conditions permit it the community supply plan may contemplate a continuous and regulated yield over time and through wet and dry cycles analogous to the dairy farmer's plan.

The difference in management of mined or continuous yield basins will become increasingly important if a recent decision[53] of the U. S. District Court in West Texas is upheld. If the courts affirm that water is a mineral within the meaning of the Internal Revenue Code[54] and the taxpayer-farmer in a mined basin proves (1) that he derives income from the extraction of the mineral and must look to that income for the return of his capital; (2) that the mineral is exhaustible; that it is not undergoing natural replacement in a significant manner; and (3) that he has a capital investment in the mineral in place, he will receive an income tax allowance for his expenses. Whatever the decision on appeal in this Texas case, it should encourage more community interest in management of ground water basins of all types.

By "community" is meant a society of people, local, state or national as distinguished from their formal organization of government

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The locations of all large supplies of ground water in New Mexico are generally believed to be known and an increase in ground-water usage in the next 20 years comparable with that of the last 20 years cannot be predicted.

In the declared Animas, Mimbres, Playas, Portales, Lea County, and Estancia Basins, as well as in other areas of intensive ground-water irrigation, water is being withdrawn primarily from storage, and water levels will continue to decline. The time limit for irrigation in the House, Clovis, Portales, northern Lea County, and Causey-Lingo areas on the Southern High Plains and in the Estancia Valley in Central New Mexico is set by the thickness of the saturated aquifer, whereas the thickness of the aquifer in most of the Animas, Mimbres, and Playas Basins is so great that pumping costs will probably limit withdrawals of water for agriculture long before the water supply is actually exhausted. The policy of the State is, insofar as is possible, to limit withdrawals in these areas to that which can be sustained for a reasonable payout period, usually about 40 years.

See also Harris, *Water Allocation Under the Appropriation Doctrine in the Lea County Basin of New Mexico,* in THE LAW OF WATER ALLOCATION IN THE EASTERN UNITED STATES (Haber & Bergen ed. 1958).

[53] Shurbet v. United States, 11 Am. Fed. Tax R.2d 592 (N.D. Tex. 1963), noted 42 TEX. L. REV. 260 (1963). The note writer emphasizes another important distinction in Texas; between percolating waters and underground streams. The burden of proof is on the party claiming the existence of an underground stream as it is in Arizona. This case was argued June 4, 1964, before the 5th Circuit. As of the date of publication, no decision has been handed down. Maricopa County Water Conservation Dist. No. 1 v. Southwest Cotton Co., 39 Ariz. 65, 4 P.2d 369 (1931).

[54] INT. REV. CODE of 1954, § 611(a): "General Rule — In the case of mines, oil and gas wells, other natural deposits, and timber, there shall be allowed as a deduction in computing taxable income a reasonable allowance for depletion." See Fleming Foundation v. Texaco, 337 S.W.2d 846 (Tex. Civ. App. 1960) ("other minerals" in a deed did not include ground water). See also Note, 37 N.D.L. REV. 298 (1961).

or the state. Individuals in this society will continue to have choices along the political spectrum and within it will be the choice of new or modified ground water legislation. It has been said that:

> The community's unique political function is to reach agreement on the standards of the common life — the objectives. A constitutional democratic system is based on man's capacity to debate and determine the standards by which he wishes to live in political community with others. With two important exceptions these standards are not fixed. They are continually being resolved; they are ever emergent.
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> The exceptions are, of course, equality and liberty, which must be accepted as standards in any democratic community. These terms have specialized, rather than abstract, meanings in this context. Equality as a standard demands that each individual shall count and shall be enabled to make his own contribution. It does not mean equal conditions for all, or that all should be considered physically or intellectually equal. Similarly, liberty does not mean an absence of compulsion or law, but rather that each individual shall be enabled to control, to a meaningful extent, his own fate . . . .[55]

Individual and community choices, through the political process, are continually being made and, in this process, the pursuit of abstractions like liberty, equality and due process, even in fashioning a ground water statute, is futile unless the terms are given operational meanings. Appeals to "absolute ownership" dogma or the conjuring up of the maxims *cujus est solum . . . et ad inferos* and *damnum absque injuria* are still harmless in some areas of the Eastern states where drainage is the main consideration or where no one is withdrawing substantial quantities of potable ground water or where as yet no one's well is contaminated. But these areas of no conflict are rapidly growing smaller.[56] When some one is injured the acts commit-

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[55] MAASS, DESIGN FOR WATER RESOURCE SYSTEMS 566 (1962).

[56] See Adams v. Grigsby 152 So. 2d 619, (La. 1963), *writ denied*, 153 So. 2d 880 (La. 1963); noted 24 LA. L. REV. 428 (1964). *Cf.* Jones v. Oz-Ark-Val Poultry Co., 228 Ark. 76, 306 S.W.2d 111 (1957); noted 11 VAND. L. REV. 945 (1958); Brown v. Lundell, 344 S.W.2d 863 (Tex. 1961); General Crude Oil Co. v. Aiken, 335 S.W.2d 229 (Tex. 1960). See also Annot., 38 A.L.R.2d 1265 (1954), and cases in A.L.R.2d Supplemental Service through mid-year 1964. See also WATER NEWSLETTER, Vol. 6, No. 10, May 21, 1964:

> Underground Waste Disposal — Two Points of View: Members of the American Institute of Chemical Engineers were told at their annual meeting that underground disposal of industrial wastes is a "safe method of waste control and is not a hazard to potable ground water." The successes of the gas and oil industries with the operation of deep well disposal techniques for salt and other wastes were cited. However, in Alabama the experiences of the oil industry indicate that more research is needed. A new study of "Water Problems Associated With Oil Production in Alabama," made by the Geological Survey and the State Oil and Gas Board, says that in one field operating since 1952 "introduction of oil field brine into ground-water aquifers and nearby streams has or will eliminate their use as sources of

ted will test the abstractions and the courts may be asked to adopt another concept, "reasonable use," because its operational definition, while not precise, encompasses the power to protect the health, safety and general welfare of the community.

There are some absolute barriers fixed by state and federal constitutions to the limits of governmental power but there are few absolute property rights. Although he was not referring to *ground* water, Justice Jackson, speaking for the court in *United States v. Willow River Power Co.*, said:[57] "Rights, property or otherwise, which are absolute against all the world, are certainly rare, and water rights are not among them."

In Arizona it is now clear that there are no absolute rights in ground waters whatever the judicial speculations[58] on the subject may have been before 1953. *Bristor v. Cheatham*,[59] which upholds proprietary rights in percolating waters, holds that these rights are limited by "reasonable use" requirements although the meaning of "reasonable use" remains undefined.

Kansas passed a 1945 water statute that was upheld in 1962[60] as applied to *ground* waters. The Kansas Supreme Court also had to consider the nature of proprietary rights in percolating waters as the Arizona Court did in *Bristor v. Cheatham*.[61] In upholding the statute and applying appropriation doctrine the Kansas Court said:[62]

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water of good quality in some areas." The 63 page illustrated publication adds that problems of contamination of water from oil field waste disposal have been found in every oil field, and points out that leaks and seepages from disposal wells are hard to detect before they have damaged the water supply.

The areas of growing conflict are clearly recognized by other disciplines. See ACKERMAN & LOF, TECHNOLOGY IN AMERICAN WATER DEVELOPMENT (1959); HIRSHLEIFER, DEHAVEN AND MILLIMAN, WATER SUPPLY, ECONOMICS, TECHNOLOGY & POLICY (1960).

[57] 324 U.S. 499, 510 (1945).

[58] See Howard v. Perrin, 8 Ariz. 347, 76 Pac. 460 (1904). See also Campbell v. Willard, 45 Ariz. 221, 42 P.2d 403 (1935); Fourzan v. Curtis, 43 Ariz. 140, 29 P.2d 722 (1934); Maricopa County Municipal Water Conservation Dist. No. 1 v. Southwest Cotton Co., 39 Ariz. 65, 4 P.2d 369 (1931).

[59] 75 Ariz. 227, 255 P.2d 173 (1953).

[60] Williams v. City of Wichita, 190 Kan. 317, 374 P.2d 578 (1962); KAN. GEN. STAT. ANN. §§ 82a-701 to -725 (1949) (Supp. 1961). Case noted in 11 KAN. L. REV. 558 (1963); see SHURTZ, KANSAS WATER RESOURCES BOARD REPORT ON THE LAWS OF KANSAS PERTAINING TO GROUND WATER, BULLETIN No. 5 (1960).

[61] 75 Ariz. 227, 255 P.2d 173 (1953).

[62] Williams v. City of Wichita, 190 Kan. 317, 374 P.2d 578, 584-589 (1962). State *ex rel.* Emery v. Knapp, 167 Kan. 546, 207 P.2d 440 (1949), upheld the 1945 Act but did not rule on the critical section [KAN. GEN. STAT. ANN. § 82a-702 (1949)] in Williams, *supra*. See Baumann v. Smrha, 145 F. Supp. 617 (D. Kan. 1956), *aff'd.*, 352 U.S. 863 (1956), upholding constitutionality of the statute. See also Williams v. City of Wichita, 279 F.2d 375 (10th Cir. 1960).

From that evidence emerges the salient and clear factual conclusion that these ground waters are percolating and hence migratory and fugitive. . . . Thus, we are dealing with a right to *use* the underground waters as they pass through the owner's soil. . . .

The constitution of Kansas contains no provision relating to the dedication, control, application or administration of either surface or underground waters, and the common law has been fundamental in this jurisdiction in determining rights of riparian and overlying owners. . . .

Prior to 1945 this court adopted and applied the English or common-law rule that percolating ground water 'belongs' to the owner of the land in which it is found. . . .

The confusion, if any, in our decisions that has resulted in the application of the common-law rule may be attributed to a lack of understanding of the meaning of the term 'ownership' as applied to percolating waters. In Acton v. Blundell [12 M. & W. 324, 152 Eng. Rep. 1223, 1843], it was held that the owner of the surface might apply subterranean waters as he pleased and that any inconvenience to his neighbor from doing so was *damnum absque injuria*. . . .

Much of the language in the cases pertaining to absolute ownership is obiter dicta and completely unnecessary to the respective decisions. Moreover, ownership as a concept is often vague and denotes only certain rights of use against certain persons with respect to certain physical phenomena. Thus the use of the term 'ownership' as applied to percolating water has never meant that the overlying owner had a property or proprietary interest in the corpus of the water itself. This necessarily follows from the physical characteristics of percolating water. It is migratory in nature and is a part of the land only so long as it is in it. There is a right of use as it passes, but there is no ownership in the absolute sense. It belongs to the overlying owner in a limited sense, that is, he has the unqualified right to capture and control it in the quantity desired and with an immunity from liability to his neighbors for doing so. . . .

Hence, the true nature of the law of percolating water rights under the English or common-law rule as applied in the Soden case [City of Emporia v. Soden, 25 Kan. 588, 37 Am. Rep. 265, (1881)], and unreversed as of June 28, 1945, was that an owner had no legal right to complain of the diminishment of the subterranean water underlying his land through pumpage of wells by irrigators, municipalities and other water users in the area. . . .

The unsuitability of such a rule as to modern day conditions was self-evident . . . .

The committee which drafted the Act, and the legislature which adopted it, considered the problem of water use rights in the light of present day knowledge concerning the inter-relationship of ground and surface water and approached

it with the realities of hydrology and natural processes rather than an adherence to outmoded legal concepts. . . . 'Any concept dealing with all water must correlate ground water and surface water.' That scientific premise is implicit in the Act. The Act makes no distinction whatsoever between ground water and surface waters but applies to both the principles and procedures which are recognized by the laws of the seventeen western states as the appropriation doctrine. . . .

It is evident that the legislature, in placing into effect the committee's recommendations, exercised the police power of the state in determining its policy that 'All water within the state of Kansas is hereby dedicated to the use of the people of the state, subject to the control and regulation of the state in the manner herein provided' (G.S. 1949, 82a-702), and in providing that 'Subject to vested rights, all waters within the state may be appropriated for beneficial use * * *,' and that nothing in the Act 'shall impair the vested right of any person except for non-use' (G.S. 1949, 82a-703). This declaration makes it clear that Kansas has embarked upon a new approach to the problem of use of the water resources of the state. . . .

The privilege of using water is unquestionably an element of the value of the land. To take away that right might be tantamount in a semi-arid country to confiscation of property. But the Act is not compulsory in its provisions. It does not compel or require a surface owner to obtain a permit in order to make use of the underlying water. Neither does it require that a permit be obtained for the installation of a well or pump or other works by means of which water can be diverted from its source to its place of use. However, such an owner, by electing not to come under the protection of the Act, is subject to the hazard of injunction in the event his usage impairs rights recognized under the Act. To that extent, the plaintiff may presently drill wells to capture and divert underlying water and apply it to beneficial use without waste, subject, however, to the preferential use rights of a vested right user or the appropriation right of one who applies water from the same source to beneficial use (82a-712, 82a-716, 82a-717a). . . .

We hold that it was within the competency of the legislature to define the 'vested rights' of common-law water users, or to establish a rule as to when and under what conditions and to what extent a vested right should be deemed to be created in such a water user (Kansas v. Colorado, 206 U.S. 46, 94, 27 S. Ct. 655, 51 L. Ed. 956, 973; Sternberger v. Seaton Co., 45 Colo. 401, 403, 102 P. 168; In re Water Rights of Hood River, 114 Or. 112, 227 P. 1065: State ex rel. Emery v. Knapp, [167 Kan. 546, 207 P.2d 440 (1949)]; Baumann v. Smrha, [145 F. Supp. 617 (D. Kan. 1956), *aff'd.*, 352 U.S. 863 (1956)]). The effect of the common-law doctrine in Kansas under the Act is little more than legal fiction. The right of the plaintiff to ground water underlying his land is to the usufruct of the water and not to the water itself. Legislation limiting the

> right to its use is in itself no more objectionable than legislation forbidding the use of property for certain purposes (Euclid Ohio v. Ambler Realty Co., 272 U.S. 365, 47 S.Ct. 114, 71 L.Ed. 303, 54 A.L.R. 1016 . . .).

Thus the Kansas law favors public regulation as well as the recognition of scientific knowledge.

In 1955 in *Southwest Engineering Co. v. Ernst*,[63] the Arizona court held that the police power could be invoked to the extent of prohibiting withdrawals of ground waters by landowners overlying critical areas:

> Where the public interest is thus significantly involved, the preferment of that interest over the property interest of the individual even to the extent of its destruction is a distinguishing characteristic of the exercise of the police power.
>
> We are of the opinion that there is a preponderant public concern in the preservation of the lands presently in cultivation. . . .

Bristor did not accept the doctrine of "absolute ownership," and appropriation theory was expressly rejected by the court on rehearing.[64] The court distinguished correlative rights doctrine and put it aside in favor of "reasonable use" doctrine, which in operational terms includes exercise of the state's police power:[65] "We think the better rule is that of reasonable use as distinguished from the doctrine of correlative rights."

In later ground water decisions the court obviated any more precise definition of "reasonable use" through interpretation of the statute and because of the peculiar fate of parts of the legislation. *Ernst v. Collins*[66] in 1956 held that the State Land Commissioner had authority under the statute to issue permits in a critical area for replacement wells only. The proposed well was not a true replacement well. But in 1957 in *Vance v. Lassen*[67] a permit was approved to drill a new well on land where there had never been a well but which had been under cultivation for more than five years before 1948. The court said:

> The statement in the decision [Ernst v. Collins] that the drilling of an entirely new well was not authorized under the statutes was too broad. The opinion failed to recognize that but

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[63] 79 Ariz. 403, 409, 410, 291 P.2d 764, 768, 769 (1955).

[64] Bristor v. Cheatham, 75 Ariz. 227, 255 P.2d 173 (1953).

[65] *Id.* at 236, 255 P.2d at 178.

[66] 81 Ariz. 178, 302 P.2d 941 (1956).

[67] 82 Ariz. 188, 310 P.2d 510 (1957).

> for the 1953 act, suspending for one year the operation of the provisions of the 1948 act, new irrigation wells could have been drilled in critical groundwater areas on qualified lands.[68]

State ex rel. Morrison v. Anway in 1960[69] held that the provision of the 1953 ground water statute which closed areas to drilling was embraced in the Act of 1954 "in that the State Land Commissioner was required to determine the critical nature of the area from factual data as distinguished from legislative declaration." Critical areas established by the Act of 1953 were freed from restrictions. The court held that a general statute [ARIZ. REV. STAT. ANN. § 1-245 (1956)] on the effect of subsequent legislation "operates to repeal and abrogate the Act of 1953." Thus, under the doctrine of "reasonable use" and this decision, a land owner could pump water from beneath one tract and use it on another though the second tract was not under cultivation before the area was designated as critical.

Thus, to return to the bovine image, while the legislature apparently chose to restrict the "milking" of given aquifers or areas, the court decided that whether the cow was approached from the left or the conventional right side made no difference. Although the *Anway* decision affirmed a summary judgment, the facts considered in the opinion indicate that no *new uses* were contemplated since the original tract of land from which withdrawals were made was lying fallow. However, the case does nothing to define "reasonable use," and in reading the decision one continues to hear an echo of the court's statement in *Bristor v. Cheatham:* "This rule [of reasonable use] does not prevent the extraction of ground water subjacent to the soil *so long as it is taken in connection with a beneficial enjoyment of the land from which it is taken. . . .*" (Emphasis added.)

After *Anway* what does this statement mean? Does it mean that the *same landowner* may shift his place of use? Does this case follow the American *ground* water rule of "reasonable use" which requires only that the supply be put to a beneficial purpose *in relation to land use?*[70] And if it does, how does this rule actually differ in practice from the common-law or English rule except to bar the plea of *damnum absque injuria?*

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[68] *Id.* at 191, 310 P.2d at 512.

[69] 87 Ariz. 206, 349 P.2d 774 (1960), noted 3 ARIZ. L. REV. 115 (1961).

[70] See *supra* note 36. ARIZ. REV. STAT. ANN. § 45-313 (1956) requires that a permit for a well in a critical area "shall contain the following: . . . 7. Legal description of the land on which use of ground water is proposed to be made." This provision was not referred to in Bristor v. Cheatham, 75 Ariz. 227, 255 P.2d 173 (1953). However, the court did say, at p. 237, 255 P.2d at 179, "the principal difficulty in the application of reasonable use doctrine is in determining what is reasonable use." The court approved and quoted from Canada v. City of Shawnee, 179 Okla. 53, 64 P.2d 694 (1937), which decided that a landowner could enjoin the taking

II. Present Methods and Areas of Administration

In the administration of ground water the Western states employ various jurisdictional approaches.

Fourteen of the Western states[71] now have statutes providing for

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of ground water *which was not used in connection with the enjoyment of the land from which it was taken.* This is the application of the reasonable use rule which the Arizona court described in *Bristor, supra* at 235, 255 P.2d at 178, as "the American rule that one may extract such water *for a reasonable, beneficial use of the land from which the same is taken . . . .*" (Emphasis added.)

Anway, supra note 69, at 209, 349 P.2d at 776, concludes that the requirements of the statute are data-gathering requirements and not a criterion established by the legislature for determining reasonable use, *i.e.*, use of water in connection with the described land.

In *Bristor* the Arizona court made much of the distinction between correlative rights and reasonable use doctrine. However, both are *sic utere tuo ut alienum non laedas* variations on the same property rights theme and the injury under one doctrine is to find that one landowner has used a "disproportionate share" of the supply and under the other that his proprietary use is "unreasonable" as it affects the adjoining landowner's enjoyment of his property. This latter is the holding of Canada v. City of Shawnee, *supra*, 64 P.2d at 697:

> [T]he rule of reasonable use is that each landowner is restricted to a reasonable exercise of his own rights and a reasonable use of his own property, in view of the similar rights of others. This does not mean that there shall be an apportionment of subterranean percolating water between adjacent landowners, for such a thing is often, if not always, impossible, and it was this same impossibility which gave rise to the English rule itself. The rule of reasonable use as to percolating waters is merely the application of the same rule as it affects all property, for ownership of property does not vest one with the right to injure his neighbor with the use of that property. If the rule of reasonable use should attempt in actual practice an apportionment of percolating water between adjacent landowners, it would but serve to illustrate the necessity of the English rule . . . . [F]ew if any cases can be found where American courts have denied a landowner the right to draw as much percolating water from under his land as he needs, even though . . . such use of the land be industrial and not agricultural. But the majority of recent decisions stop short at and forbid the harmful extraction of percolating water for sale at a distance.

North Dakota has recently held that the statute of 1955 (N.D. Sess. Laws 1955, ch. 345), which declares ground water to be public and subject to appropriation does not impair rights obtained by beneficial use prior to 1955. Bristor v. Cheatham, *supra*, was cited in support of the proposition that the landowner "may use such amount of water as may be necessary for some useful and beneficial purpose in connection with the land from which it was taken." See Volkmann v. City of Crosby, 120 N.W.2d 18, 22 (N.D. 1963). North Dakota did not abolish common law water rights or repeal an early statute protecting them (N.D. Cent. Code § 47-01-13 (1817)) until 1963. See N.D. Sess. Laws 1963, ch. 419, § 7. *Cf.* Knight v. Grimes, 127 N.W.2d 708 (S.D. 1964).

[71] Ariz. Rev. Stat. Ann. §§ 45-301 to -324 (1956) (Supp. 1963); Colo. Rev. Stat. Ann. §§ 148-18-1 to -15 (Supp. 1960); Idaho Code Ann. §§ 42-226 to -239 (Supp. 1963). In Idaho a water right may still be acquired outside of the administrative process by actual use, see Silkey v. Tiegs, 51 Idaho 344, 351-53, 5 P.2d 1049, 1053 (1931); Hutchins, The Idaho Law of Water Rights 106, 107 (1956).

The administrative process is generally held to be exclusive in the other states. Kan. Gen. Stat. Ann. §§ 82a-701 to -725 (1949) (Supp. 1961); Mont. Rev. Codes Ann. §§ 89-2911 to -2936 (Supp. 1963); Nev. Rev. Stat. §§ 534.010-.190 (1957); N.M. Stat. Ann. §§ 75-11-1 to -36 (1953) (Supp. 1963); N.D. Cent. Code §§ 61-01-01 to -04-21 (Supp. 1963); Okla. Stat. Ann. Tit. 82, §§

some form of state-wide, or basin, or area, administration *though all do not provide for designation of critical or controlled areas.*

The extent of administrative control over withdrawals varies greatly. In these fourteen states ground water rights recognized under common law rules, or that were exercised or perfected under rules applicable before legislation was passed or a time fixed by the legislation, are protected.[72] Appropriation doctrine predominates in this group of states.[73]

Eight of these same states provide for the designation of critical or controlled areas.[74] Within these areas withdrawals may be limited or prohibited by administrative action[75] based on hydrological data and the physical condition of the aquifer or area.

1001 - 1019 (1951) (Supp. 1964); ORE. REV. STAT. §§ 537.505 - .745 (1963); S.D. CODE §§ 73-1-1 to -3-1 (Supp. 1963); WASH. REV. CODE §§ 90.44 - .240 (1962); WYO. STAT. ANN. §§ 41-121 to -142 (1957).

[72] ARIZ. REV. STAT. ANN. §§ 45-313(C), -322 (1956), Bristor v. Cheatham, 75 Ariz. 227, 255 P.2d 173 (1953); COLO. REV. STAT. ANN. § 148-18-2 (1963), Whitten v. Coit, 385 P.2d 131 (Colo. 1963); IDAHO CODE ANN. § 42-226 (Supp. 1963); KAN. GEN. STAT. ANN. § 82a-701(d) (Supp. 1961) and § 82a-702 (1949), Williams v. City of Wichita, 190 Kan. 317, 374 P.2d 578 (1962); MONT. REV. CODES ANN. § 89-2912 (1961), McGowan v. United States, 206 F. Supp. 439 (D. Mont. 1962); NEV. REV. STAT. § 534.100 (1957); N.M. STAT. ANN. § 75-11-4 (1953); Volkmann v. City of Crosby, 120 N.W.2d 18 (N.D. 1963); OKLA. STAT. ANN. Tit. 82, § 1005 (Supp. 1963); ORE. REV. STAT. §§ 537.505 - .795 (1963), (Ore. Sess. Laws 1955, ch. 708, §§ 6(3), 7, 12); S.D. CODE §§ 61.0401(11), .0403 (Supp. 1960). See Knight v. Grimes, 127 N.W.2d 708 (S.D. 1964), affirming dismissal of a declaratory judgment action seeking to test common law ground water rights under a 1955 appropriation statute. The trial court held there was a valid appropriation based upon the theory that *there was a subterranean stream* from which plaintiff appropriated. The Supreme Court affirmed but said, at 710: "the trial judge, erroneously, we think, found that the waters under the plaintiff's land constitute a definite stream. We believe the record shows only percolating waters to underlie the plaintiff's land." In affirming the trial judge's dismissal, the Supreme Court said, at 708: "he recognized plaintiff's vested right to irrigate four acres of land *by reason of prior appropriation.*" (Emphasis added.) UTAH CODE ANN. § 73-1-1 (1953); WASH. REV. CODE § 90.44.090 (1963); WYO. STAT. ANN. § 41-122 (1957).

[73] See *supra* notes 71, 72 for exceptions. Idaho is an appropriation state. But IDAHO CODE ANN. § 42-226 (Supp. 1961) contains the phrase "beneficial use in *reasonable amounts* through appropriation." (Emphasis added.) Could this mean control over the diversion based upon the type of use or the kind of crop grown?

[74] ARIZ. REV. STAT. ANN. §§ 45-301(1) (Supp. 1963) and 45-308 (1956); COLO. REV. STAT. ANN. § 148-18-3 (1963); IDAHO CODE ANN. § 42-233a (Supp. 1963); MONT. REV. CODES ANN. § 89-2915 (1961); NEV. REV. STAT. § 534.030 (1957); OKLA. STAT. ANN. Tit. 82 § 1007 (1951); ORE. REV. STAT. §§ 537.620, .720 (1963); WYO. STAT. ANN. § 41-129 (1957).

[75] These are all "permit" states except Montana, which is a "notice" state, and permits are not generally required. However, notice of appropriation of ground water saves the priority from the day of filing the notice, MONT. REV. CODES ANN. § 89-2913 (1961) and in controlled areas a permit is required, MONT. REV. CODES ANN. § 89-2918 (1961). The Montana State Engineer recently stated:

> We wish to reply to your July 14 letter requesting a copy of any administrative rules and regulations our office may have issued under our 1961 Ground-Water Code.
>
> As this is a relatively new law, Montana has not yet become involved in controlled ground-water areas. Furthermore, thus far we have been

New Mexico legislation does not specify critical areas but gives the State Engineer jurisdiction over declared basins that have "reasonably ascertainable boundaries."[76] These boundaries may be modified on the basis of more adequate data, and these areas may be closed to further withdrawals.[77]

The Washington statute[78] provides that "The supervisor shall have jurisdiction over the withdrawals of ground water . . . and may limit withdrawals by appropriators to enforce the maintenance of a safe sustaining yield. . . . For this purpose he shall . . . designate ground water areas or subareas . . ." which may be modified as more data are available.

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fortunate in that a number of ground-water complaints have not arisen in any particular section of the State. We have, of course, had individual problems which we have been required to settle but these have not necessitated setting up rules and regulations for ground-water administration.

Letter from Everett V. Darlington
to Robert Emmet Clark, July 21, 1964.

The Arizona supervisor reports:

In accordance with your request for a copy of the rules and regulations dealing with designation of critical areas, please be informed that the statutory sections have not been implemented by departmental rules and regulations as the pertinent sections have apparently been determined broad enough to fully cover the matter.

Letter from F. C. Ryan
to Robert Emmet Clark, July 22, 1964.

The Nevada Field Engineer reports:

We have received your request of July 14, 1964, for a copy of any administrative rules or regulations regarding responsibilities vested under NRS 534.030.

We have no published rules and regulations available on this subject.

Letter from Roland D. Westergard
to Robert Emmet Clark, July 22, 1964.

The State Reclamation Engineer of Idaho reports:

Replying to your letter of July 14, 1964, inquiring about administrative regulations this office employs in connection with Idaho Code 42-233a; our determination of a critical ground water area is based upon a field examination and analysis of information at hand.

We have published no administrative rules or regulations, we do publish in a local paper a description of the area of the proposed critical area and thereafter follow Idaho Code 42-233a, as it applies.

Letter from Carl E. Tappan
to Robert Emmet Clark, July 20, 1964.

[76] N.M. STAT. ANN. § 75-11-1 (Supp. 1963): "The water of underground streams, channels, artesian basins, reservoirs, or lakes, having reasonably ascertainable boundaries, are hereby declared to be public waters and to belong to the public and to be subject to appropriation for beneficial use." In 1960 there were 19 ground water basins. Clark, *New Mexico Water Law Since 1955*, 2 NAT. RES. J. 484, 496 (1962). Others have been added or boundaries have been modified since 1960.

[77] For discussion, see Clark, *supra* note 76.

[78] WASH. REV. CODE § 90.44.130 (1962).

California, Nebraska and Texas among the 17 Western states[79] have no state-wide administrative controls such as exist in the other states. California faces many problems over the kinds of ground water rights[80] that exist, or may be acquired, and the quantum of each right as well as problems of depletion, salt water intrusion, storage and urban distribution. Efforts were made through legislation[81] to halt the race among pumpers who, following the Raymond basin decision,[82] were put on notice that their rights would be measured by the amount of water pumped. A Water Recordation Act[83] was passed in 1955 which requires users, in named counties, who extract in excess of 25 acre feet annually, to file a notice of their extractions with the State Water Rights Board. The latest effort is a ground water protection law of 1961[84] which allows for planning and for construction. However, no state administrative overview is provided in California despite the vast projections of the California Water Plan.[85]

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[79] Alaska and Hawaii are not included here. However, both have ground water interests. ALASKA CONST. art. VIII, §§ 2, 13: "All surface and subsurface waters reserved to the people for common use, except mineral and medicinal waters, are subject to appropriation." *Cf.* Trillingham v. Alaska Housing Authority, 109 F. Supp. 924 (D. Alaska 1953); HAWAII REV. LAWS §§ 87B-1 to -37 (Supp. 1960). See City Mill Co. Ltd. v. Honolulu Sewer and Water Comm., 30 Hawaii 912 (1929). See HUTCHINS, THE HAWAIIAN SYSTEM OF WATER RIGHTS (1946).

[80] HUTCHINS, THE CALIFORNIA LAW OF WATER RIGHTS 426-465 (1956). See also *supra* note 33. California law applicable to ground water management is discussed by Krieger & Banks, *supra* note 49. See also GROUND WATER PROBLEMS IN CALIFORNIA, ASSEMBLY INTERIM COMMITTEE ON WATER TO THE CALIFORNIA LEGISLATURE, Vol. 26, No. 4 (1962).

[81] CAL. WATER CODE §§ 1005.1, .2 (Supp. 1964).

[82] City of Pasadena v. City of Alhambra, 33 Cal. 2d 908, 207 P.2d 17 (1949), *cert. denied*, 339 U.S. 937 (1950).

[83] CAL. WATER CODE §§ 4999 - 5008 (1956) (Supp. 1964).

[84] CAL. WATER CODE §§ 12920 - 12925 (Supp. 1964).

[85] CAL. WATER CODE §§ 10000 - 10003 (1956), 10000, 10001.3, 10004-7 (Supp. 1964). In response to an inquiry about ground water management, the Director of the California Department of Water Resources stated:

> This is in reply to your letter of July 14, 1964, inquiring about our policy for ground water basin management. The department has no power to regulate ground water basins, and would prefer that such regulation be provided by courts and local agencies.
>
> Letter from William E. Warne
> to Robert Emmet Clark, July 30, 1964.

The Director also referred to the limited authority of the State Water Rights

Nebraska and Texas also have minimal controls. Nebraska has had a well registration statute[86] since 1955 and Texas provides for regulation of artesian wells[87] in order to control waste but not to regulate uses. Both states have provisions for underground water conservation districts. The Nebraska statute was passed in 1959 but no districts have been formed.[88] Three districts were organized in Texas

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Board where it may act as a court referee. In situations where sea water intrusion threatens, the Board may request a preliminary injunction under the CAL. WATER CODE §§ 2020 (Supp. 1964), 2021 (1956).

The Water Rights Board recently refused to take jurisdiction over the applications of three Southern California municipal districts which desired to appropriate Northern California water for underground storage in Southern California after delivery. A decision in this matter would have involved anticipatory allocation of storage capacity. See In the Matter of Applications 20732, 20800 and 20871, State of California, State Water Rights Board, Decision D 1121, April 4, 1963 (Decision Rejecting and Cancelling Applications for Lack of Jurisdiction).

The Director's letter was accompanied by several important papers by engineers and attorneys working with ground water management problems in California. Large scale ground water management studies are under way in that state. Obviously these cannot ignore or gloss over the problems of law and political choice.

[86] NEB. REV. STAT. §§ 46-601 to -613 (1943) (Supp. 1963). Since 1963, permits are necessary to drill within 50 feet of a stream (Neb. Sess. Laws 1963, ch. 275). The same session defined ground water, see ch. 274. Another law granted authority to the Director of Water Resources "to grant and administer permits to cities, villages or to municipal corporations to supply water to cities and villages," to locate and maintain ground water supplies and to continue existing uses and transportation of ground water to the same. Provisions for protesting such permits and for judicial review are provided. This new law also states:

> Nothing in this act shall be construed as limiting any right of an owner of an estate or interest in or concerning land to recover damages for any injury done to his land or to any water rights appurtenant thereto; nor shall this act limit rights of condemnation which cities, villages and municipal corporations have under the laws of the State of Nebraska.

Neb. Sess. Laws 1963, ch. 276 § 10.

[87] TEX. REV. CIV. STAT. arts. 7600-05 (1954); see also TEX. REV. CIV. STAT. arts. 7621b-c (Supp. 1963) (relating to injection wells for industrial and municipal waste). See also Greenhill & Gee, *supra* note 34.

[88] NEB. REV. STAT. §§ 46-614 to -634 (1943) (Supp. 1963). The Director of the Department of Water Resources states:

> In response to your letter of July 14, 1964, this is to inform you that no ground water conservation districts have been organized under the Nebraska law providing for such districts under Chapter 6, Article 46, RRS Nebraska, 1943.
>
> Letter from Dan S. Jones
> to Robert Emmet Clark, July 17, 1964.

before 1958;[89] in 1960 there were six districts[90] and no new ones have been created. No limits are placed on pumping in these districts, although permits are required and spacing regulations are followed in the High Plains District of West Texas which has published the following figures for March 1964:[91]

Decline in Water Levels

	Five-Year Period 1959-1964	One-Year Period 1963-1964
Average Decline Per Well	10.34 ft.	2.49 ft.
Average Decline Per Year Per Well	2.07 ft.	2.49 ft.

Total Wells Drilled

1962	1963	11-Year Total
1,388	1,746	20,487

[89] High Plains Underground Water Conservation District No. 1, Lubbock; North Plains Ground Water Conservation District No. 2, Dumas; Panhandle Ground Water Conservation District No. 3, White Deer. All have published rules on waste, well spacing, and artificial recharge. See Bagley, *Water Rights Law and Public Policies Relating to Ground Water "Mining" in the Southwestern States*, 5 J. OF LAW AND ECON. 144 (1961). See also Greenhill & Gee, *supra* note 34 at 629:

> Since the Texas Supreme Court has followed the absolute ownership theory of the *East* case and *Acton v. Blundell*, and has held that the courts cannot enjoin anything but wanton and willful waste, it is clearly up to the legislature to provide for the conservation of ground water and the prevention of waste.
>
> Under legislative authorization underground water conservation districts may be formed over subdivisions of ground water reservoirs. Certain acts are defined by statute as waste, and these districts are authorized to make rules to prevent such waste. They are authorized to provide for the spacing of wells, to require permits for the drilling of wells, and 'to regulate the production therefrom so as to minimize as far as practicable the drawdown of the water table or the reduction of artesian pressure. . . .' They are further authorized to promulgate 'rules and regulations for the purpose of conserving, preserving, protecting, and recharging the underground water reservoir or subdivision thereof.' Several districts have already been formed.

[90] RAYNER & MCMILLION, UNDERGROUND WATER CONSERVATION DISTRICTS IN TEXAS, TEXAS BOARD OF WATER ENGINEERS (Preliminary Copy, Subject to Revision, August, 1960). The Texas Water Commission, in a letter to the author dated July 22, 1964, states: "To our knowledge no additional districts have been created since publication of this bulletin."

[91] THE CROSS SECTION (Monthly Publication of High Plains District No. 1), Vol. 10, No. 10, p. 1 (March, 1964); Vol. 10, No. 9 (Feb. 1964). See Broadhurst, *Ground Water Management at the Local Level*, PROCEEDINGS, NAT. RECLAMATION ASS'N., Oct. 23-25, 1963; William L. Broadhurst was formerly Chief Hydrologist for the High Plains District, Lubbock, Texas.

More recently another High Plains District Engineer stated:

> How can we make advancements with our water problems when people are still cloaked in superstition and tradition concerning this problem? How can we make advancements when even the legal profession has borrowed from the criminal code terms such as 'fugitive' and 'common enemy' and applied them to certain occurrences of water in nature: We must shake the shackles of tradition and begin to understand the laws of nature which control water.

Reddell, *Depletion of Ground Water Should Be a Concern of All*, THE CROSS SECTION (July, 1964).

Colorado is counted among the states with an administrative framework. However, although critical ground water areas may be designated or removed by the state commission,[92] the designation may also be nullified by local action, and this has been done.[93] It has been said that the local control statutes in Colorado "are generally conceded to be ineffective" and apparently some further regulatory measures are being considered.[94]

The other seven states in the category have different methods for designating critical areas but all provide that action may be taken by the administrator on his own motion or by a specified minimum number of ground water users in the area.[95] Some states require a public hearing[96] over the designation, and Idaho formerly[97] provided for the filing of a protest against the granting of a permit in such an area. Idaho also provides for a unique local dispute resolving board.[98] But in none of these states is the veto power over a critical area designation granted to the local users.

The engineering approach to traditional, institutional, social and constitutional problems is notoriously over simplified as is this analogy to the "criminal code," which statement was "borrowed" without much previous examination. This is another example of confusion over the meaning and nature of choice; over *who chooses the law* with the *result* of the choice. In fairness it cannot be said that this confusion is greater in the East than in the West. The present national travail over reapportionment loudly tells us about some of the confusion. Laws that are the result of continuing choices by largely rural legislatures have not been signally successful in meeting current problems, including water problems.

[92] COLO. REV. STAT. ANN. § 148-18-3 (1963).

[93] The State Engineer of Colorado states:

> We have not issued administrative rules and regulations in regards to the methods for designation of critical ground water areas in Colorado. This procedure is presented in full in (Colo. Rev. Stat.) 147-19-3.
>
> An attempt was made to create a 'critical district' on one of the tributaries of the South Platte River on January 10, 1958, by the Colorado Water Commission. The Commission proceeded with the election, as required by statute, of an Advisory Board and this board later vetoed the Commission's action.
>
> Letter from George A. Brown,
>
> Assistant Engineer, Ground Water Section
> to Robert Emmet Clark, July 30, 1964.

See also Harnsberger, *supra* note 12 at 757.

[94] *Ibid.*

[95] ARIZ. REV. STAT. ANN. § 45-308A (1956); IDAHO CODE ANN. § 42-233a (Supp. 1963); MONT. REV. CODES ANN. § 89-2914 (Supp. 1963); NEV. REV. STAT. §§ 534.030, .120 (1957); OKLA. STAT. ANN. Tit. 82, § 1007 (1951); ORE. REV. STAT. §§ 537.620(3), .730 (1963); WYO. STAT. ANN. § 41-129 (1957).

[96] ARIZ. REV. STAT. ANN. § 45-309 (1956); MONT. REV. CODES ANN. § 89-2914 (Supp. 1963); OKLA. STAT. ANN. Tit. 82, § 1009 (1951) (the Oklahoma statute allows a public hearing before the district court, after which the court issues a decree); ORE. REV. STAT. § 537.730(2) (1963).

[97] IDAHO CODE ANN. § 42-233b; repealed by Idaho Sess. Laws 1963, ch. 216, § 4.

[98] IDAHO CODE ANN. §§ 42-237b(4), 42-237c, 42-237d (Supp. 1963).

In Washington[99] the "supervisor" is empowered to "designate ground water areas and subareas, designate depth zones within any such area or subarea, or modify the boundaries of an existing area, or subarea, or zones to the end that the withdrawals therefrom may be administratively controlled in order that overdraft of public ground waters may be prevented so far as is feasible." The supervisor also has authority to limit subsequent appropriators "to an amount that will maintain and provide a safe sustaining yield." Although the New Mexico statute[100] does not expressly grant such powers to the State Engineer, his power to declare basins and to administer them authorizes him to develop rational procedures for protecting existing rights even to the extent of closing a basin, spacing wells and developing a system for mining a basin over a specified period of time.[101]

The question of the effectiveness of local controls, including the local veto power, was raised by Professor Harnsberger in the specific context of Nebraska's recent legislation. But the more general question he asks is pursued here:

> A preliminary question in considering alternatives to court adjudications is whether local control, centralized management at the state level, or a combination of both would provide the most favorable arrangement. Stated differently, should ground water in Nebraska continue to be treated as a free good or does the state [the state-wide community] have a legitimate interest in how it is used?[102]

He suggests[103] that "a particular institutional framework will minimize conflict between competing users and promote utilization closer to the optimum point." What the institution shall be is not specified, but from the evidence offered it is clear that a local management institution has serious drawbacks. The Report of the Kansas Water Resources Board for 1956[104] reached a similar conclusion about the Texas type of local institution:

> Local control and regulation is often sound and necessary. But it has its limitations. This is especially true in the area of water control. There are some areas of Kansas where the Texas system might work well. In other areas, the interrelation of ground and surface water would make such provisions unwork-

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[99] WASH. REV. CODE § 90.44.130 (1962).

[100] N.M. STAT. ANN. § 75-11-1 (Supp. 1963).

[101] See Bliss, *Administration of Ground Water in New Mexico*, 43 J. OF AM. WATER WORKS ASS'N. 435 (1951); Clark, *supra* note 76, at 508-529; Harris, *New Mexico's Role in Development of Law of Ground Water*, 31 DICTA 41 (1954).

[102] Harnsberger, *supra* note 12, at 753.

[103] Harnsberger, *supra* note 12, at 754.

[104] Quoted in SHURTZ, *supra* note 60, at 76. In 1961 Kansas provided for county water districts and for engineering investigation before creation of such districts

> able. Modern science eschews distinctions not firmly grounded upon the hydrological cycle. . . .
>
> The overlying landowners are not the only individuals interested or affected in ground-water development. Certainly the state as a whole has a paramount interest. A central agency will generally have the essential technical skill, powers, resources, and available coordinated data to plan and control state water development as a whole. And it will generally be free from the local political pressures and biases that often wreck the machinery of local control. Moreover, central administration will preclude the countless administrative problems and difficulties that necessarily arise from the very nature of a system of many local administrative units. For these reasons the Texas ground-water solution is not recommended at this time.

The entire Kansas ground water experience of study, research, legislation and judicial decisions has been one of detailed and continuous attention to private property rights and the public interest. *Williams v. City of Wichita*[105] in 1962 reviews the long process while upholding powers granted under the 1945 statute which require the landowner to apply for approval of the Chief Engineer of the state water resources agency[106] for use of ground water underlying his land.

The Western states, with the exceptions discussed,[107] have all gone beyond the stage of merely endorsing data-gathering legislation. The first step has usually been a well registration or well record requirement. The great majority of states have endorsed, and most of these actually apply, state-wide management procedures and policies. The methods are not uniform nor are all of them equally effective, but the principle of broad community participation is established.

The question whether local community participation could be made more effective in ground water matters seems to have been partly

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by the county commissioners, or upon petition of "not less than one hundred (100) persons or corporations, who shall be owners of real estate in the district sought to be created, or by the owners of at least fifty one percent (51%) of the land in the district." Taxing and other powers are provided for maintaining water wells, water lines, etc. See KAN. GEN. STAT. ANN. § 19-3536 to -3544 (Supp. 1961); Kan. Sess. Laws 1961, ch. 472, p. 915. See also KAN. GEN. STAT. ANN. §§ 82a-612 to -636 (Supp. 1961); Kan. Sess. Laws 1963, ch. 512 §§ 1-9, referring to rural water districts.

[105] 190 Kan. 317, 374 P.2d 578 (1962), *appeal denied*, 375 U.S. 7 (1963), *rehearing denied*, 375 U.S. 936 (1963).

[106] The Kansas Division of Water Resources was created in 1927 as part of the State Board of Agriculture, KAN. GEN. STAT. ANN. §§ 74-506a-d, -509, -510 (1949). Another body, the Kansas Water Resources Board, was created in 1955 for investigative and planning purposes, see KAN. GEN. STAT. ANN. §§ 74-2605 to -2611 (Supp. 1961). Under the provisions of Kan. Sess. Laws 1963, ch. 514, §§ 1-27, the water resources board is charged with the responsibility of formulating a state water plan in conjunction with the division of water resources and other state agencies.

[107] Perhaps California, Nebraska and Texas will not be exceptions very long. Nebraska's 1963 amendments are some evidence. See *supra* note 86.

answered in the negative by recent experience.[108] History also seems to give the same answer if we range back through local public health enforcement, including water pollution problems,[109] and even to the earliest administrative law on waters in the West which provided that local commissioners of the Territories of Colorado and Wyoming should make allocations of surface flows in their "different localities."[110] This law was soon changed: in Colorado in the direction of minimal statewide administrative authority which persists today and in Wyoming in the form of Elwood Mead's administrative control statute that became the inspiration if not the model of Western water law after 1890.[111]

III. CONCLUSIONS

The prospect for improved ground water management does not lie in an either/or choice. District control and local management under overall state supervision offer opportunities in ground water administration. There are precedents in the handling of many municipal and county government problems. Some state control has always existed even for home rule communities, especially in fiscal and taxing matters.[112] However the special district device or the local government unit[113] now used for other purposes may still be a vital institution for handling problems such as municipal supply and pollution control,

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[108] Harnsberger, *supra* note 12 at 754-759.

[109] See State *ex rel.* Martin v. City of Juneau, 238 Wis. 564, 300 N.W. 187, 191 (1941). The court said:

> Under the provisions of ch. 144, neither the State Board of Health nor the State Committee on Water Pollution is obliged to postpone action [because the City of Juneau had failed to act] until the health of the community is impaired or some citizen has died as a result of the pollution of the water of the state. The conditions which lead to such a result are well and scientifically known and the power of these bodies extends to prevention as well as to the remediation of conditions which are destructive of the public health.

[110] Lasky, *supra* note 13, 1 ROCKY MT. L. REV. at 167:

> Wyoming's first irrigation law was the act of December 10, 1875.
>
> 'In case the volume of water in said stream, creek or river shall not be sufficient to supply the continual wants of the entire county through which it passes, then the county commissioner . . . shall appoint three commissioners . . . whose duty it shall be to apportion in a just and equitable proportion a certain amount of water . . . to the different localities, *as they may in their judgment think best for the interests of all parties concerned.*'
>
> Note that the test of relative right of user was not priority of use but the best interests of all concerned according to the discretion of an administrative organ which itself put its decision into force and operation. A very similar statute was passed in Colorado in 1861 but though never formally repealed, has had no recognition by the courts.

[111] Wyo. Sess. Laws, 1890-91, ch. 8 (an Act providing for the supervision and use of the waters of the State).

[112] See FORDHAM, LOCAL GOVERNMENT LAW, CASES AND MATERIALS 74-200, 548 (1949).

[113] See Comment, *The Role of Local Government in Water Law*, 1959 WIS. L. REV. 117. See also N.M. STAT. ANN. § 75-8-2 (1953).

which go hand in hand in urban growth, underground storage and conjunctive management of surface and ground waters.

What "particular institutional framework" to devise or select is a matter of community choice. A state water resources commission at the policy-making level and within the framework prepared by the legislature is one choice. An advisory commission to guide the state administrative official is another approach. Local district committees under the supervision of the state may also be feasible. Many water problems are entirely local in nature. But a unitary point of view must be encouraged both as to a state-wide viewpoint for all uses of water and also as to the effect of changed conditions in one part of the state upon other parts of the community. This will become more evident as ground waters in some areas are "mined" out and the economy of a whole area is changed.

New Mexico abolished its board of water commissioners in 1923,[114] and thereby large policy-making functions fell into the state engineer's hands. That under this system New Mexico has evolved a number of rational ground water management procedures is high compliment to the administrative officials and a "particular institutional framework." But there are other choices. Iowa since 1957[115] has chosen to bring together both surface and ground water management and to regulate used and unused rights. The Iowa Natural Resources Council is an agency of state government with state-wide authority. The Water Commissioner is the administrative official from whom permits for water uses must be obtained. There are examples in other states of different kinds of agencies.[116]

Improved ground water legislation in Arizona and elsewhere is necessary. The older provisions of the legislation and the court decisions are primarily concerned with the acquisition of new rights and

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[114] N.M. STAT. ANN. § 75-2-11 (1953). See MANN, *supra* note 2, at 119:

> For much of the period between statehood and 1942, the responsibility for management of water resources was lodged in an independent state water commissioner. Between 1923 and 1925 the state land commissioner doubled as water commissioner but lost this added responsibility to a newly-appointed water commissioner who retained the job until 1942 when his functions were again transferred to the Land Department, where they have since remained. Invariably the excuse for organizational changes was "economy and efficiency," but economy usually took precedence over efficiency. It should be noted that administrative rationalization may be only a facade for the actual destruction of a program. The elimination of the Underground Water Commission by transferring its functions to the Land Department in 1954 was clearly a case in point.

[115] IOWA CODE ANN. §§ 455A.1 - .39 (Supp. 1964); O'Connell, *supra* note 37.

[116] See, *e.g.*, KAN. GEN. STAT. ANN. §§ 82a-705, -705a (Supp. 1961) (chief engineer of division of water resources of state board of agriculture); OKLA. STAT. ANN. Tit. 82 §§ 1005, 1006 (Supp. 1964) (state water resources board); WASH. REV. CODE § 90.44.050 (1962) (supervisor of water resources).

the original security of such rights, some *in vacuo,* as it were. The large questions now concern the prospects for beneficial uses by all classes of users and under systems of management which will avoid conflicts over claims based on the right to static pressure,[117] or over senior surface flows being depleted by junior pumpers — or the application of reasonable use doctrine.

In short, the main problem is one of management and not ownership. And here a statement made in 1900 by the Wyoming Supreme Court[118] with reference to surface water administration applies to the more complicated ground-surface water problems of today:

> [I]n the progress of our legislation in respect to the use of water for irrigation and other beneficial purposes, the significant feature of the changes and additions from time to time has been the principle of centralized public control and regulation. One can hardly fail to be impressed with the gradual tendency exhibited in the various acts towards the greater effectiveness of *public supervision.* (Emphasis added.)

But how, through legislation, to improve methods for private and public supervision of ground water is not the first question. To paraphrase Professor Harnsberger:[119] Any skilled draftsman can prepare

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[117] See Pima Farms Co. v. Proctor, 30 Ariz. 96, 245 Pac. 369 (1926). See also Current Creek Irrigation Co. v. Andrews, 9 Utah 2d 324, 344 P.2d 528 (1959); noted in 9 KAN. L. REV. 88 (1960), 6 UTAH L. REV. 575 (1959), 5 UTAH L. REV. 181 (1956). These cases uphold rights in minimum levels of pressure. In Colorado, damages and an injunction were allowed for interfering with a farmer's spring. The defendant's pump in a gravel pit cut off the flow of the spring, Karl F. Hehl Eng'r Co. v. Hubbell, 132 Colo. 96, 285 P.2d 593 (1955). See Note, 28 ROCKY MT. L. REV. 145, 147 (1955) indicating that an appropriative right includes a minimum level of pressure. *Cf.* KAN. GEN. STAT. ANN. § 82a-711a (Supp. 1961). NEV. REV. STAT. § 534.110 (1957), WYO. STAT. ANN. § 41-141 (1957). See Templeton v. Pecos Valley Artesian Conservancy Dist., 65 N.M. 59, 332 P.2d 465 (1958) where the conflict was over a surface water user being permitted to change his point of diversion to wells. See Clark, *supra* note 76, at 535.

As shown by the cases reviewed here, ground waters have been divided for technical and doctrinal reasons into three categories: subterranean streams, rechargeable tributary percolating waters related to a stream system, and non-tributary ground waters in aquifers or basins that are not being replenished, or where the rate of recharge is negligible. The need for precise knowledge of the type of aquifer under consideration is emphasized by the Arizona cases and, more recently, by the Colorado decision, Whitten v. Coit, 385 P.2d 131 (Colo. 1963). In Colorado, ground water is presumed to be tributary to a stream system and therefore is public and subject to appropriation, De Haas v. Benesch, 116 Colo. 344, 181 P.2d 453 (1947), although non-tributary ground water is private property, Whitten v. Coit, *supra.* In Arizona, where ground waters are presumed to be percolating, subterranean streams are public and subject to appropriation while percolating waters are private property subject to reasonable use limitations. Any legislation or conjunctive management plan for surface and ground waters and for the recharge, storage and uses of ground water must anticipate the conflicts based upon these distinctions.

[118] Farm Inv. Co. v. Carpenter, 9 Wyo. 110, 61 Pac. 258, 50 L.R.A. 747, 87 Am. St. Rep. 918 (1900).

[119] Harnsberger, *supra* note 12, at 764.

legislation;[120] first the people must choose the goals of the legislation.

[120] But on the difficulty of his task, see Moses, *The Correlation of Surface and Underground Water Rights*, 27 J. OF OKLA. BAR ASS'N 2095 (1956), a speech given before Mineral Law Section, ABA, Dallas, August 28, 1956, in which Moses quoted from an address of Perry Ling (member of the Arizona Bar), given before the Colorado Bar Association (PROCEEDINGS, 1956 ANNUAL CONVENTION):

> [W]hile all of the ground water statutes place some responsibility upon the State Engineer or corresponding State official, the statutes vary widely from State to State in scope and effectiveness. Some do little more than provide for the appropriation of ground waters .... Certainly one problem arises by reason of the inadequacy of present legislation.
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> Authority given administrators of these new laws is generally extremely limited or in some cases nonexistent. This inability to resolve disputes at an administrative level may result in litigation which does not bring all claimants before the court.
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> Whether boards or commissions should be composed of local persons or the members should serve on a state-wide basis has been another source of considerable discussion.
>
> New problems can be foreseen. Public control so far has been mainly limited to appropriative rights. The problem of imposing public control upon adjudicated correlative rights does not appear insoluble, but a solution has not yet been attempted.
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> In conclusion, it is necessary, in appraising the strong and . . . weak points of ground water laws and administration, to keep in mind that most of the laws are still comparatively new and experience in administration comparatively limited. Material changes may yet be made in some of the laws, but in view of the widespread and increasing development, repudiation of the broad principle of administration seems no more likely than repudiation of surface water administration. Major problems encountered in controlling this invisible and oftentimes baffling resource have been such as to test the ability and courage of the stoutest administrators. Their growing experience with current problems should aid in handling the new ones of the future.
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> In considering the future regulation of ground water there are certain aspects that should be considered, some of which are:
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> 1. Should legislation attempt to balance recharge and withdrawal?
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> 2. Should provision be made for "local option" elections in an overdeveloped basin to require "cut backs" where present withdrawals exceed safe supply?
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> 3. Should conservation districts be encouraged?
>
> 4. Should priorities be recognized under all conditions?
>
> 5. Should provision be made for immediate cessation of drilling new wells on recommendation of the State Engineer pending a hearing to determine the safe yield of the basin?
>
> 6. Should the laws be administered by the State Engineer or by a Commission?
>
> 7. Should the duty of water be set at a maximum number of acre feet pear year in overdeveloped areas?
>
> There are many other unanswered questions . . . .

The conclusion of a recent report by a national committe re-emphasizes the interstate dimension of ground water uses which received the attention of the Senate Select Committee, see Comm. Print No. 6 at 208:

> The increased utilization of ground water basins, both as sources of supply and depositories of waste disposal foretell increased activity in the courts, the legislature and administrative bureaus. That these same problems have interstate repercussions is borne out by the problems arising in the common ground water basins between Arizona and New Mexico and the efforts of those states to resolve their problems under the decree of the Supreme Court in Arizona v. California.